

to the study of chemical reactions, by J. Verschaell. The Pulfrich refractometer used, when compared with a standard spectrometer, gave a constant difference in the index of refraction amounting to -0.00069 , this being probably due to the insertion of a prism of different material in the refractometer. With this correction the refractometer readings could be taken as absolutely trustworthy to the fourth decimal place. The author shows that all disagreements with the law governing the index of refraction of mixtures indicate a chemical reaction (1) if the observed index is lower than the calculated index; or (2) if it is higher by such an amount that the difference cannot be attributed to a change of volume.—On the parietal eye, the epiphysis, the paraphysis, and the choroid plexus of the third ventricle, by P. Francotti. This paper contains a detailed description, illustrated by excellent microphotographs, of these rudimentary organs as they appear in the slow-worm and the human embryo.

Wiedemann's *Annalen der Physik und Chemie*, No. 3.—On elliptic polarisation of reflected light, by K. E. F. Schmidt. This first part of the work deals with the influence of foreign surface layers. Contrary to the conclusions of Drude, Röntgen, and Lord Rayleigh, the author shows that no observation justifies us in assuming that the elliptic polarisation of light reflected from polished surfaces is produced by layers of the polishing material. The polish attached to the mirror is only capable of modifying the phenomenon. The constancy of the ellipticity of light reflected from mirrors cleaned by means of a gelatine film, which is pulled off when hardened, implies a constancy of the cause of this phenomenon, independent of the polishing powder used.—Remarks upon Paschen's paper on "The emission of heated gases," by E. Pringsheim. The author maintains that the so-called discontinuous heat spectra observed by Paschen, cannot be fitly described as such, since the "band" due to CO_2 extends over a region three times as large, and that of steam over one twenty times as large, as the whole visible spectrum.—On normal and anomalous changes of phase during the reflection of light by metals, by W. Wernicke. The change of phase produced by the reflection of light from a silver film between two transparent media, the anterior one of which has the higher index of refraction, is an acceleration which increases continuously from zero to $\frac{1}{4}$ or $\frac{3}{8}$ of a wave-length as the thickness of the silver grows from zero to opacity. This is the normal change of phase. An anomalous retardation takes place when there are traces of another substance between the silver and the front medium. It may amount to something between $\frac{1}{8}$ and $\frac{3}{8}$ of a wave-length.—On the proportionality between lowering of freezing point and osmotic pressure, by Svante Arrhenius.—On a more exact method for the determination of the lowering of freezing points, by E. H. Loomis. The apparatus used was an improved form of Beckmann's freezing tube. To avoid the fluctuations of temperature associated with the melting or solidifying of ice in water, sometimes amounting to 0.1°C ., the tube was lengthened so as to remove the substance from the warmer air, and a freezing mixture was in each case employed, which gave a temperature only about 0.3° lower than the actual freezing point of the substance experimented upon.

In the numbers of the *Journal of Botany* for March and April, the articles are almost entirely descriptive. Mr. E. G. Baker has an interesting paper on the section *Rhynchospetalum* of *Lobelia*, in which two new species from Africa are described and figured.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Meteorological Society, March 21.—Mr. R. Inwards, President, in the chair.—Mr. W. H. Dines read a paper on the relation between the mean quarterly temperature and the death-rate. The Registrar-General's Quarterly Returns for the whole of England since 1862 were taken by the author, and the number of deaths in each quarter expressed as a departure per thousand from that particular quarter's average; the value so obtained being placed side by side with the corresponding departure of the temperature at Greenwich from its mean value. The rule seems to be that a cold winter is unhealthy, and a mild winter healthy; and that a hot summer is always unhealthy, and a cold summer healthy. Mr. Dines also

read a paper on the duration and lateral extent of gusts of wind and the measurement of their intensity. From observations and experiments which he has made with his new anemometer, Mr. Dines is inclined to think that a gust seldom maintains its full force for more than one or two seconds; and also that the extreme velocity mostly occurs in lines which are roughly parallel to the direction of the wind.—Mr. R. H. Scott, F.R.S., exhibited a diagram showing some remarkable sudden changes of the barometer in the Hebrides on February 23, 1894. At 8 a.m. the reading at Stornoway was 29.39 inches, being a fall of 0.7 inch since the previous day, and at 6 p.m. the reading was 28.58 inches. From the trace of the self-recording aneroid it appears that the minimum, 28.50 inches, occurred about 5.30 p.m., and that the fall during the half-hour preceding the minimum was nearly 0.2 inch, the rise after the minimum being nearly as rapid.—The other paper read was on the calculation of photographic cloud measurements, by Dr. K. G. Olsson.

Geological Society, March 21.—Dr. Henry Woodward, F.R.S., President, in the chair.—The following communications were read:—On the origin of certain novaculites and quartzites, by Frank Rutley. The novaculites of Arkansas have already been admirably described by Mr. Griswold in vol. iii. of the Arkansas Survey Report for 1890. One of the characteristic microscopic features in Ouachita stone is there stated to consist in the presence of numerous cavities, often of sharply-defined rhombohedral form, which Mr. Griswold considers to have been originally occupied by crystals of calcite or dolomite. The author, while admitting that the cavities were no doubt once filled by the latter mineral, differs from Mr. Griswold, and some of the authorities he cites, concerning the origin of the rock. Crystalline dolomites, when dissolving, become disintegrated into minute but well-formed rhombohedra. As the process of dissolution proceeds these crystals may become so eroded that the rhombohedral form is no longer to be recognised. The author pointed out that no inconsiderable proportion of the cavities in Ouachita stone present irregular boundaries, such as the moulds of partially eroded rhombohedra would show. He then offered a fresh interpretation of these cavities, so far as the origin of the rock was concerned: (1) He assumed that beds of crystalline magnesian limestone have been slowly dissolved by ordinary atmospheric agency and the percolation of water charged with carbonic acid or other solvent. (2) That, as the limestone was being dissolved, it was at the same time being replaced by silica, which enveloped minute isolated crystals and groups of crystals, some perfect, others in various stages of erosion. (3) That the silica assumed the condition of chalcedony, its specific gravity, as stated by Mr. Griswold and as determined by the author, being low in comparison with that of quartz. (4) The residuum of the original dolomite or dolomitic limestone was removed, leaving the perfect and imperfect rhombohedral cavities. A calciferous, gold-bearing quartzite from the Zululand gold-fields was described, and a similar origin ascribed to it, but in this case the original rock appears to have been simply a limestone, not a dolomite. The gold seemed to occur chiefly in the calcareous portions of the rock. The author also suggested a similar origin for the saddle-reefs of the Bendigo gold-field. In all of these cases the train of reasoning is based upon the conclusions arrived at in his previous paper, "On the dwindling and disappearance of limestones." He indicated that the stratigraphical relations of the Arkansas novaculites, as described in Mr. Griswold's report, were such as to warrant the assumption that limestones once occurred in the position now occupied by beds of novaculite. Many collateral matters were dealt with in the paper which cannot be given in abstract; among them was an attempt to classify quartzites. Dr. G. J. Hinde and Prof. Hull discussed some of the conclusions in the paper, and the author briefly replied.—Note on the occurrence of perlitic cracks in quartz, by W. W. Watts. The author of this communication described some specimens of the porphyritic pitchstone of Sandy Braes in Antrim, which are deposited in the Museum of Science and Art in Dublin, and in that of Practical Geology in Jermyn Street. They exhibit admirable examples of perlitic structure in the brown glassy matrix, and the presence of polygonal, circumferential, and radial cracks is noticed. The porphyritic crystals of quartz are traversed by curved fissures of retreat, not so perfect as those found in the glass, but better than those usually produced by the rapid cooling of Canada balsam. The fissures in the quartz are frequently prolonged into the matrix,

undergoing only a very slight and almost imperceptible deviation in direction at the junction. But in addition to this the quartz is often found to act as a centre of strain, the inner cracks of the perlite being wholly in quartz, the next traversing both, and the outer ones in glass only. In other examples the outer cracks of a matrix perlite sometimes enter the quartz, while in others polygonal cracks occur, and join up, in the quartz, and give off radial cracks precisely like those of the matrix. These observations lead to the conclusion that the quartz and glass must have contracted at about the same rate, and that the observation of perlitic structure in a rock with trachytic or felsitic matrix by no means proves that the rock is necessarily a devitrified glass.—Mr. Rutley, Mr. Harker, and Prof. J. F. Blake spoke upon the subject of the paper, and the author replied to their remarks.

PARIS.

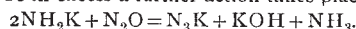
Academy of Sciences, March 27.—M. Loewy in the chair.—A study of the crystallised acetylides of barium and strontium, by M. Henri Moissan. Nearly pure crystalline C_2Ba and C_2Sr are produced by heating the oxides of barium and strontium (or carbonates) with sugar charcoal in the electric furnace. These bodies are immediately decomposed by water, and give pure acetylene. Their properties and reactions resemble those of calcium acetylide. When exposed to the action of halogens at a slightly raised temperature they become incandescent, the barium compound being most readily attacked.—Electric registration of the movements of the semilunar valves determining the opening and closing of the aortic orifice, by M. A. Chauveau.—On two isomeric methylcyanocamphors, by MM. A. Haller and Minguin. The preparation and properties

of α -methylcyanocamphor, C_8H_{14} $\begin{array}{l} \diagup CMcCy \\ \diagdown CO \end{array}$, and β -methylcyanocamphor, C_8H_{14} $\begin{array}{l} \diagup CCy \\ \diagdown COMe \end{array}$, are described. By hydrolysis

with alcoholic potash the former yields a dicarboxylic acid, the latter gives a hydroxy monocarboxylic acid and methyl alcohol.—Occultation of Spica Virginis, March 22, 1894, observed at Paris Observatory, by M. G. Bigourdan.—Observations of the planet BC, made at the Paris Observatory, by M. G. Bigourdan.—Note by M. Ch. Trépiéd on photographic observations of planets, made by MM. Rambaud and F. Sv, at the Algiers Observatory.—On the approximate development of the perturbation function in the case of inequalities of a high order.—Applications to Mercury and Venus, by M. Maurice Hamy.—On a corollary of Catalan's theorem, by M. Maurice Moureaux. An extension proving a theorem of which Catalan's is a special case. "If a sum of n squares be raised to any power which is itself a power of 2, there results a sum of n squares."—Results obtained by new arrangements for diminishing the vibrations of vessels, by M. Augustin Normand.—On the minimum electromotive force requisite for the electrolysis of electrolytes, by M. Max Le Blanc. A discussion of the remarks made by M. Berthelot on a previous paper, followed by further remarks by the latter. On the mutual solubility of salts, by M. H. Le Chatelier.—Action of nitrogen, nitrous oxide, and nitric oxide on alkaline ammoniums, by M. A. Joannis. Nitrogen has no action on sodammonium or potassammonium. Nitrous oxide, not in excess, reacts in accordance with the equation:



if the oxide be in excess a further action takes place:



An alkaline salt of hydrazoic acid is thus produced from purely inorganic materials. Nitric oxide forms the alkaline hyponitrites KNO and $NaNO$ with $K_2N_2H_6$ and $Na_2N_2H_6$ dissolved in liquid ammonia.—On the mode of action of the pancreas in the regulation of the glucose-forming function of the liver. New facts concerning the mechanism of pancreatic diabetes. Note by M. M. Kaufmann.—On physiological antiseptics, by M. A. Tripier.—Properties of the serum of animals protected by inoculation against the poison of serpents, by M. A. Calmette. The great value of such serum as a therapeutic agent is emphasised. Injections of the protected serum together with solution of chloride of lime possess great therapeutic power.—On the copulation of some Cephalopoda—*Sepioida Komdeletii* (Leach), *Rossia macrosoma* (d. Ch.), and *Octopus vulgaris* (Lam.), by

M. Émile G. Racovitza.—On the seismic rose of a place, by M. de Montessus.

GÖTTINGEN.

Royal Society of Sciences.—In Nos. 15 to 21 of the *Nachrichten* appear the following papers of scientific interest:—

November 1.—Gauss, de integratione formulæ differentialis $(1 + n \cos \phi) \nu d\phi$, edited (in Latin) by E. Schering. The paper was found by Prof. W. Meyer in the archives of the Society, and probably dates from 1795.

November 8.—W. Voigt, contributions to the molecular theory of piezo-electricity.

November 15.—A. Peter, experiments on the cultivation of "resting" seeds. J. Thomae, on the differentiation of a definite integral with regard to its upper limit.

December 13.—Robert Fricke, on indefinite quadratic forms with three and four variables. H. Weber, the equalisation of temperature between two heterogeneous bodies in contact. O. Wallach, on the behaviour of the oximes of cyclical ketones (I.).

December 20.—A. Brill, on symmetric functions of pairs of variables. W. Nernst, a method for the determination of dielectric constants.

December 27.—Robert Haussner, the theory of Bernoulli's and Euler's numbers.

BOOKS, PAMPHLETS, AND SERIALS RECEIVED.

BOOKS.—Royal University of Ireland, Calendar for the Year 1894 (Dublin, Thom).—Fauna of British India, including Ceylon and Burma; Moths, Vol. 2: G. F. Hampson (Taylor and Francis).—A Monograph of Lichens: Rev. J. M. Crombie, Part 1 (London, British Museum, Natural History).—Papers and Notes on the Glacial Geology of Great Britain and Ireland: H. C. Lewis (Longmans).—The Health Results of Europe: Dr. T. Linn, 2nd edition (Kimpton).—Biological Lectures delivered at the Marine Biological Laboratory of Wood's Hole in the Summer Session of 1893 (Boston, Ginn).—Disease and Race: Jadroo (Sonnenschein).—Annals of the Royal Botanic Garden, Calcutta; Vol. iv., the Anonaceæ of British India: Dr. G. King (Calcutta).

PAMPHLETS.—Notes on Polarised Light: A. E. Munby (Newcastle-on-Tyne, Reid).—Investigations of Recent Typhoid-Fever Epidemics in Massachusetts: Prof. W. T. Sedgwick (Boston).—A New Story of the Stars: A. W. Bickerton (Christchurch, N.Z.).

SERIALS.—Bulletin of the New York Mathematical Society, March (New York, Macmillan).—Science Progress, No. 2 (Scientific Press).—Journal of the Royal Agricultural Society of England, Vol. v. Part 1, No. 17 (Murray).—Internationales Archiv für Ethnographie, Band vii. Heft 2 (K. Paul).

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